

# Model Development for Be-induced Control of Carbon Sputtering

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## **Summary of task (\$50k request):**

We propose development of models of surface morphology with mixed materials, especially Be, C, and W, that retain essential mechanisms to be compared with experimental data and more detailed MD and kinetic Monte Carlo simulations. Special attention will be given to understanding and predicting the impact of strong radial plasma transport (blobs). In addition, we will work to couple such models to whole-edge plasma transport codes. The budget will be used to support a student at UCSD to carry out much of the work with guidance from more experienced researchers, thereby contribute to the important need for training new plasma-material interaction scientists. We will coordinate and provide models for other mixed-material modeling (e.g., WBC) to obtain high leverage.

## **Impact:**

- Will provide physics-based model of Be surface coverage to understand and project results to ITER and other future devices; validate with lab experiments (PISCES)
- The reduced model will allow direct coupling to whole-edge transport of such impurities
- Training and utilizing a PhD student in this area provides needed future expertise